



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

LABORATORY TESTS OF ANGER, FEAR AND SEX INTEREST

By HENRY T. MOORE, Dartmouth College

The following experiments were devised with a view to determining approximately by a simple behavioristic test an individual's liability to be disturbed by emotional stimuli of certain definite kinds. Stated briefly, the plan of procedure was to measure the effectiveness of emotional disturbance in terms of delay in the solution of a problem given just prior to the introduction of the emotional stimulus.

The problems given were mental multiplications of selected numbers between 64 and 99 by 4, 6, 7, 8 and 9. The various number combinations were made as nearly as possible of the same difficulty, and proved to be of a sort that required from five to fifteen seconds for the average student to solve correctly when left undisturbed. The average of the mean variations of fifteen subjects for four problems each under normal conditions was 4.2 sec., hence this kind of task seemed to be one in which variations of more than six or seven seconds in the time of solution were likely to indicate something more than the varying difficulty of the task itself. Whenever a considerable delay resulted from the application of a distracting stimulus, the amount of this delay would seem to be in some sense a measure of the amount of distraction. Since, however, the special concern was not with degrees of distraction, but with amounts of anger, fear, etc., it was necessary to eliminate as far as possible the effect of general distractibility in each case of emotional stimulus. For example, in attempting to determine the extent to which an individual was annoyed by an anger provoking stimulus, it was not possible to compare his time under provocation with his normal time, for the reason that he might be easily distracted by any kind of irrelevant stimulus, and yet not very irascible. To get at the specific anger effect it was necessary to compare his "anger time" with the average of all the "distraction times" taken together.

Twenty-two subjects were given twenty problems, during each of which some sort of emotional distraction was at-

tempted. The twenty problems were divided into five series of four problems each. The stimuli accompanying the first series were intended to provoke anger; those with the second series to provoke fear; with the third, sex interest; with the fourth, repulsion; with the fifth embarrassment in the presence of a crowd.

Anger Stimuli. These tests were meant to involve (1) anger at an unjust accusation, (2) anger at bodily annoyance at the hands of another person, (3) anger at having been prevented from carrying out the task called for.

The attempt to excite anger at an unjust accusation was made as follows. Before the subject was aware that the experiment proper had begun, the experimenter stopped and said,—“By the way, Mr. S. Before I forget about it, I think I ought to bring to your attention a letter which came to me to-day, and which I am sure contains an error on someone's part that you can set me right about.” The experimenter then handed him a typewritten letter purporting to come from the offices of administration, and which read as follows: “I have just learned from the registrar that an examination proctor has filed a statement in which he expresses it as his opinion that Mr. S. was guilty of dishonesty in connection with one of the mid-year examinations. While the circumstances do not amount to proof, it is advised that all those instructors with whom Mr. S. is taking courses give especial attention to his methods of class-room work, with a view to determining what measures should be adopted in dealing with his case.” After having allowed fifteen seconds for the reading of the letter, and having remarked that it might be better to leave the consideration of it until later, as someone had undoubtedly made a mistake, the subject was asked to solve the first problem. The difficulty with this particular stimulus is that not all of the subjects lend the same degree of credence to the letter.

Two tests of anger at bodily annoyance at the hands of another person were next in order. During the solution of one problem the experimenter had a third person draw his hand sharply upwards across the face of the subject, striking smartly the tip of his nose in passing. A similar test consisted in striking the subject sharply three times on the cheek during his effort to solve the problem.

A third type of provocation was that of having an assistant interfere in three successive efforts made by the subject. The interference consisted in saying aloud a series of numbers calculated to make it impossible for the subject to carry out

successfully his mental multiplication. After three such disturbances he was allowed to finish without interruption.

Fear Stimuli. Four types of fear stimulus were tried. They were devised with a view to bringing into play fear of snakes, of personal attack in the dark, of electrical shock, and of falling.

As a test of the disturbing effect of the fear of snakes, the subject was seated in the center of a room completely dark, and some reference was made to snakes. Immediately thereafter the problem was given him, and while he was attempting the solution, a five foot length of rubber tubing was drawn slowly around his neck, coming in contact with the skin at the back.

During the solution of a second problem the fear of personal attack was brought into play by having the assistant, who had all the while been concealed noiselessly behind the chair in which the subject was seated, suddenly place his hand, slightly chilled from recent immersion in cold water, about the forehead of the subject.

For the third fear test the subject was seated on the threshold of a door which opened above an eighteen inch drop into an adjacent room. After allowing him to become aware of the distance to the floor behind him, his chair was tilted back at such an angle that he was to fall back into the next room as soon as released. He was then asked to close his eyes, and the assistant noiselessly took a position behind the chair and made ready to catch it at a distance of about one foot from the floor. Immediately after beginning the solution of the problem the subject was allowed to fall almost to the floor; he was then lifted to the original tilted position and held there until he succeeded at his task.

During a fourth problem the disturbing influence was the expectation of receiving an electrical shock of unknown intensity. After professing to him that the test was to be one of ability to endure pain, and asking him if he knew how many volts he could endure, the experimenter had him take in hand two exposed electric wires which seemed to be connected with a wooden box containing four electric lamps, which lighted up every time the experimenter turned on the current by snapping the switch. Prior to taking the exposed wires the subject had seen the experimenter turn on the current twice as if to make sure that the connections were all intact. Upon giving out the problem to the subject the experimenter moved toward the switch and at the end of five seconds turned it on; immediately thereafter he turned it off, and

began to busy himself pretending to rectify an apparent break in the connection of the wiring, such as might satisfactorily explain to the subject why he had felt no shock when the current was first turned on. After ten seconds of such delay the switch was again snapped on, and the same pretence gone through with as many as three times, unless the subject had meantime solved the problem.

Sex Interest. The four stimuli used for this instinct were all of the same sort, for the reason that only one kind of stimulus suggested itself as being both practicable and likely to produce some degree of excitement. Four photographs of well-known nudes,—“La Source” by Greuze, two paintings of Venus by Titian, and a Venus by Giorgione answered the purpose. The subject was asked to perform his multiplication while looking at a nude.

Repulsion. Of the four stimuli used, one was smell, one visual, and two involved a combination of smell and touch. First the subject submitted to a moderately strong whiff of asafoetida; next he multiplied while looking at a picture of human entrails; his third problem was done while holding a human brain over a jar in which the odor of formalin was quite distinct, and the fourth while he immersed his hand in the midst of a number of sheep's brains in another jar which also contained formalin.

Embarrassment. In order to test the degree to which the subject's mental operations would be retarded by his having to face a crowd, he was given four problems to solve while seated conspicuously in the presence of a class room full of watching students. In most cases the number of onlookers was sixty-five, but for a few men it was necessary to use a group of twenty-three.

After taking an average of the subject's times for the twenty problems, all of which were given with some accompanying distraction, a separate average was made of the times of the anger series, fear series, etc. When the anger time was then compared with the general average time, an anger score was computed in terms of the percentage of increase or decrease over the general average time. When the percentage of increase was great, it was interpreted as meaning that the element of anger, over and above general distraction, was peculiarly effective in retarding that individual's reactions. By comparing the various percentages of the different subjects it was now possible to rank each of the twenty-two subjects with respect to each of the five emotions, rank 1 indicating the

greatest and rank 22 the least amount of disturbance for a given emotion. The table of percentages and ranks follows:

Sub- ject	Anger		Fear		Sex interest		Repul- sion		Embarrass- ment	
	%	Rank	%	Rank	%	Rank	%	Rank	%	Rank
Bo...	80	2.5	2	17	-28	17.5	-34	15.5	-24	12
Br...	-5	12	3	16	37	1	3	7.5	-39	17
Bw...	-29	18	120	1	-84	22	-35	17	27	4.5
Ca...	2	9	11	15	-28	17.5	20	10	-4	10
Cl...	-43	19	23	10.5	-25	16	-81	22	148	1
Cr...	-55	21	23	10.5	9	9	5	5.5	17	6
Do...	4	8	77	3	19	4	-37	18	-35	14
Fe...	31	6	-39	22	14	14	-6	9	X	X
Gr...	29	7	-20	20	-39	19	3	7.5	27	4.5
Ho...	-48	20	56	6	-13	13	-31	14	34	2
Li...	108	1	39	7	-65	21	-24	13	-59	19
Ly...	80	2.5	-7	18	-60	20	-42	20	28	3
Mu...	-4	10.5	30	9	-3	11	-21	11	X	X
Ni...	-21	16	58	5	-9	12	-34	15.5	6	9
Pa...	-6	14	12	14	12	8	5	5.5	15	7
Pe...	-28	17	76	4	-24	14	-39	19	14	8
Qu...	-4	10.5	19	13	14	5.5	14	3	-60	20
Sm...	48	4	22	12	13	7	-55	21	-28	13
St...	-57	22	102	2	4	10	9	4	-57	18
Wh...	-6	14	-25	21	-25	16	66	1	-7	11
Wr...	-6	14	31	8	31	2	-22	12	-36	15.5
Wt...	37	5	-10	19	27	3	-20	10	-36	15.5

As a partial check on the above rankings sixteen of the subjects were asked to rank themselves on a scale of twenty-two places, each judging by what he knew of his own emotional traits and those of his fellows. Sixty-two statements were obtained from the sixteen men. It was found that the average deviation of a subject's estimate of himself from the ranking of the test was 4.5 places on a scale of twenty-two places, which is equivalent to a positive correlation of .37. For fifty-seven of the sixty-two judgments the average deviation from the test ranks was only 3.5 places, or the equivalent of a correlation of .51; and twenty-six of the judgments fell within one place of the corresponding test rank. A further and more complete check, which is to be applied as soon as the data are available, is the correction of the test ranks with an order of ranking based on the consensus of opinion of the whole group, each subject judging every other subject with respect to the five emotional traits.

CONCLUSIONS

1. The individual variations in the above test are quite sufficient to make it possible to rank a group of subjects in

respect to the amount of interference created by a given emotion.

2. Individual differences are greatest in respect to the capacity for anger and embarrassment, which show a mean variation of 35 on the scale of percentages used; sex interest and repulsion are more constant from individual to individual, as indicated by mean variations of 27 and 24 respectively. Fear stands midway with a mean variation of 31.

3. Fear caused by far the most powerful disturbances in the thought processes involved. The average fear time was 28 per cent higher than the general average of all the emotion times. Next followed anger with an average of 4.86 per cent more than the general average; embarrassment ranked third with minus 3.5; sex interest fourth with minus 10; and repulsion fifth with minus 16.

4. A comparison of the results for the different emotions suggests that an individual's capacity for fear and for anger are to a certain extent mutually limiting quantities. Their negative correlation of minus .48 is large enough to be considered significant. None of the other correlations were large enough to call for especial comment.

The writer is at present engaged in extending these tests to a larger number of subjects. A beginning was made with 125 individuals, but war conditions have since reduced the number to 44. Two more stimuli have been added to the list for fear and anger, and as a further check on the validity of the method, its results are to be compared with those from a series of memory tests in which the chief point of memorability is to be the emotional interest of the material. Before the method can be entirely satisfactory it will be necessary to arrive at a set of stimuli all of which are accepted at face value by the subject, as were the falling and class-room tests in the above experiments. It is evident also that the variety of stimuli for each emotion should be large enough to cover a considerable number of typical cases.